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ABSTRACT

Although the use of personality traits as criteria for performance appraisal is still dominant, behavior-oriented measures of job performance have become more and more popular. One such test used, Behaviorally Anchored Rating Scales (BARS), seems to have two shortcomings. The individual scales are multidimensional, making it difficult for a rater to choose a "most typical behavior." Additionally, a certain amount of information is wasted. A new instrument, the Behavioral Description Index (BDI), is proposed which provides for utilization of a larger percentage of the total pool of behavior samples, and permits the use of multidimensional samples. The BDI was tested at workshops arranged through five Canadian banks. Findings indicated that the BDI shows less halo and central tendency, and has a higher information content than BARS. (Author/BMW)

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JOB BEHAVIOUR SAMPLING:

A METHOD TO INCREASE THE

INFORMATION CONTENT OF PERFORMANCE FEEDBACK

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Although the use of personality traits as criteria for performance appraisal is still dominant, behavior oriented measures of job performance have become more and more popular [Campbell, Dunnette, Lawler, and Weick, 1970, p. 64]. One of the first techniques utilised in this field was Flanagan's Critical Incident method [Flanagan, 1954]. He defined the critical requirements of a job as those behaviors which are crucial in making a difference between doing a job effectively and doing it ineffectively. This technique was expanded and modified by Smith and Kendall [1963] and Campbell, et al. [1970], and is now better known as Behaviorally Anchored Rating Scale (BARS), or Behavior Expectation Scale (BES) [Zedeck and Baker, 1972; Bernandin, LaShells, Smith, and Alvares, 1976].

According to Dunnette [1966], the behavioral approach to performance appraisal reduces much of the ambiguity of trait ratings by reducing the performance construct to the job itself (see also Harari and Zedeck, 1972). This desirable characteristic of behavioral scales is empirically supported by Fogli, Hulin, and Blood's [1971] and Smith and Kendall's [1963] generally high interrater agreement ($r \geq .97$) on the scale value assigned to behavioral descriptions and by the conceptual unidimensionality of behavioral incidents within scales [Campbell, et al., 1970].

Despite the intuitive appeal of behavior oriented scales [Bernardin, LaShells, Smith, and Alvares, 1976; Bernardin and Walter, 1977; Zedeck, Jacobs, and Kafry, 1976], and other suggested advantages [Zedeck, Imperato, Krausz, Oleno, 1974], recent reviews of the literature [Schwab, Heneman, and DeCotiis, 1975; Schwind, 1977] have not been encouraging. By comparing behavior oriented scales with Graphic Rating Scales (GRS) and/or Summated Rating Scales (SRS), researchers found either no or only modest superiority of BARS over GRS or SRS and, because of that,

questioned the justification for the investment of the vast amount of time and effort required for the development of BARS [Borman and Dunnette, 1975].

One of the requirements for a measure of managerial effectiveness is that it should encompass the total domain of a manager's job responsibility [Campbell, et al., 1970; p. 107]. When critical incidents are gneerated, the intention is to sample to a significant degree the behaviour domain of a job dimension. The problem is that there are often so many job dimensions that it is impractical to develop scales for each one, since a rater very likely will refuse to evaluate a ratee on 30 or 40 dimensions. For this reason, job dimensions usually are collapsed into a manageable number, e.g. 5 to 10. As a consequence of this approach, most scales utilizing critical incidents use independent behaviour samples, thus forcing the rater to make a difficult choice, opening up the rating procedure to possible biases, like leniency and halo.

To illustrate the problem an example is taken from Campbell, Dunnette, Arvey & Hellervik [1973]. Campbell, et al., identified nine job dimensions of department managers (see Exhibit 1). A BARS for one of the dimensions was included in the article as an example (see Exhibit 2). A rough analysis of the behaviour items seem to point to five relatively independent types of behaviour. There, Items 1 and 2 (1 and 2 are also the scale points) seem to describe "making promises", 3 and 5 "directing", 4 and 6 "showing consideration", 7 and 9 "training", and 8 "delegation of responsibility." It is conceivable that all of these five behaviours could be displayed at the same time. If this is true, then it is also conceivable that

different raters (in this case the store manager and assistant store manager) make different choices; i.e., select different behaviour dimensions to evaluate a ratee. It may be that the store manager emphasizes different behaviours than the assistant manager or that both have different attitudes toward the department manager, causing one to perceive only positive behaviours while the other concentrates on negative behaviours. Evaluation using different behaviour dimensions accentuates the opportunity for personal biases to operate -- either positively or negatively -- thereby resulting in relatively low inter-rater reliability. The literature review by Schwab, et al. [1975] indicated an inter-rater reliability ranging from .31 to .55. It can be argued [Borman, 1974; Klimoski and London, 1974; Schwab, et al., 1975] that the low or moderate inter-rater reliability is caused by using raters from different managerial levels, but it seems equally likely that similar results can be expected if raters from the same level are used, e.g. peers. Since many of the behaviour descriptions are independent, the choice will depend on personal biases. Only scales with unidimensional behaviour descriptions would avoid or reduce this problem. Of course, the alternate solution would be to use a scale which does not have unidimensionality as a requirement. Such a scale will be discussed later.

One of the other shortcomings of BARS seems to be the waste of valuable information [Schwab, et al., 1975; Schwind, 1977]. After the development or collection of critical incidents for a certain job, they are put through the validation, retranslation, and rating process, and they must fulfill the standard deviation criterion [Smith and Kendall, 1963]. Usually 20 to 50 critical incidents per job dimension survive. Yet only between 5 and 10, depending on the number of anchoring points of the scale, are utilised, all others are discarded. Undoubtedly those items which are not used contain valuable information about the job dimension to which they were attributed in the retranslation process. The decision to eliminate them is made on the basis of arbitrarily chosen criteria: a convenient mean value to fit the scale points, and the degree of agreement between raters as measured by the standard deviation.

A New Performance Evaluation Scale: The Behavior Description Index (BDI)

In order to improve the rating characteristics of behavior oriented scales and reduce their shortcomings, a new scale is proposed, based on descriptions of critical job behavior incidents. The development of these incidents is similar to the development of incidents for BARS (write-up, validation, retranslation) but the rating of the incidents from very ineffective to extremely effective is dropped. Instead of selecting 5, 7 or 9 incidents per job dimension (depending on the number of scale points chosen) the selection of a larger number of

behavioral incidents is suggested, the limit being determined only by the capacity--and willingness--of raters to read through and check off a certain amount of behavior descriptions. Tests so far have shown that raters are quite willing to check off 20 or 30 items per scale, with a total of 5 scales. It is expected that 30 or 40 items per scale may be optimal, since an increase in numbers of items very likely will trigger a fatigue effect in raters, resulting in such negative rating characteristics as halo and leniency.

The behavior incidents are listed randomly, each with a check-off column on the right side of the page (see Exhibit 3). The rater responds to the question: "Does the ratee exhibit the described behavior consistently (all the time)?" or, in the case of an ineffective behavior sample: "Does the ratee exhibit the described behavior at all?" The responses (ratings) can either be evaluated individually to determine specific weaknesses, or can be converted into point scores. Of course, the responses can be given any weight the rater (or the evaluator of the ratings) desires. A simple solution would be to attribute one point to a positive response given to a positive item (a desirable behavior is exhibited consistently), similarly to a negative response given to a negative item (an undesirable behavior is not exhibited). A positive response to a negative item (a negative behavior is exhibited), and a negative response to a positive item (a positive behavior is not exhibited consistently) would result in zero points. A superior could determine in advance what scores would be acceptable or unacceptable; e.g. out of 30 possible points (assuming that 30 behavior samples were chosen per scale):-

0 - 15 may mean: urgent training required
(or, if measured after training; training ineffective)

16 - 20 may mean: training recommended

21 - 25 may mean: refresher course may be useful

26 - 30 may mean: no training required

Method

Development of Job Behavior Sample

Five large Canadian chartered banks were involved in the development and validation of the new scale. Since the use of the scale was planned primarily to be in the training evaluation area, it was agreed upon between the investigator and the 5 training managers of the banks to select as a target group assistant branch managers, since their job position required a large amount of continuous training. The training managers, themselves having been for at least two years in an assistant branch manager's position, determined that this job had 5 main aspects which could be described as:

1. Administration: quarterly analyses, monthly reports, routine work, branch security, internal correspondence, correspondence with other banks, co-operation with manager, supplies, housekeeping, repairs.
2. Customer Relations: complaints, correspondence, special service (counseling in complex matters), service maintenance, special efforts.
3. Marketing: advertising, display material, local campaigns, open house, marketing of bank services.
4. Personnel Administration: salary administration, performance appraisal, hiring and firing, disciplinary

actions, motivation, encouragement, moral support, personal problems, vacation and holiday scheduling.

5. Training: any job-related training and development activity, explanations, support in problem solving, advise, informing, up-dating, course scheduling, training follow-up.

Workshops were arranged with all 5 banks, attended by 5 branch managers, 5 assistant branch managers, and 5 bank clerks and tellers. The reason for this group mix was to take into account every aspect of the job of an assistant branch manager, as perceived by superiors, job incumbents, and their subordinates. Participants were informed about the purpose of the study, and asked to write down examples of effective and ineffective job behaviors of an assistant branch manager. Between 600 and 1,000 behavior samples were collected from each workshop. After editing and removal of redundant items, approximately 300 to 400 items per bank remained. They were listed in random order and submitted to groups of 5 judges (experienced job encumbants) from each bank. The judges were asked to determine whether each item was a valid description of an assistant branch manager's job behavior, and secondly, they had to categorise each item into one of the 5 job dimensions mentioned above (Administration, Customer Relations, Marketing, Personnel, and Training). Items were retained if 80% of the judges agreed on their validity and category. Approximately 80 to 150 behavior samples survived this process. These items were listed again, this time ordered into their respective categories, and sent to a second group consisting of 25 judges (in all banks). These judges were asked to rate each item on a 1 to 7 scale as to the degree of effectiveness the item described, ranging from very

very ineffective to extremely effective. The means of all ratings were calculated, and items were retained if the standard deviation of their ratings did not exceed 1.0. Approximately 50 to 80 behavior samples per dimension remained from each bank's initial sample pool. Those items were used to develop Behaviorally Anchored Rating Scales for each bank. Since the main purpose of the study was to develop an evaluation instrument which was valid for all banks, the validation process was not yet completed.

The remaining items from all banks were pooled according to their category, and redundant items removed. From the remaining behavior samples 50 items per job dimension were selected according to the lowest standard deviation criterion (i.e. highest degree of agreement among judges). These items were listed and sent to 200 judges in each bank, a total of 1,000 judges. They were asked to judge each item as to its validity as a typical job behavior of an assistant branch manager, and secondly, to rate it on a 1 to 7 scale as to the degree of effectiveness it described in their opinion. Out of 1,000 mailed rating lists, 511 usable were returned (response rate 51%). Items were retained if they fulfilled the following requirements:

1. 80% of <u>all</u> judges and
2. 60% of the judges <u>of the individual banks</u> agreed on the validity of the item;
3. the standard deviation of the item did not exceed 1.5.

A total of 120 items could be retained.

Development of Different Evaluation Instruments

In line with Schwab, et al.'s [1975] recommendation that for comparison purposes more than two instruments should be utilised, a Graphic Rating Scale (GRS), a Behaviorally Anchored Rating Scale (BARS), and a Behavior Description Index (BDI) were developed. The GRS was basically the adaptation of a 7-point rating scale used by the banks for their regular annual performance appraisal (see Exhibit 4). The BARS and the BDI instruments, on the other hand, were developed by using the job behavior samples mentioned before. The items for the BARS instrument were selected according to a) ratings closest to a scale point (1 to 7), and b) lowest possible standard deviation (see Exhibit 5). As it turned out, no items could be found for the midpoint range of the scales (4). This problem is discussed by Landy and Guion [1970], who suggest that polarisation is a necessary consequence of eliminating items which do not have meaning to individuals.

For the BDI instrument it was arbitrarily decided to utilise 20 job behavior samples per job dimension, or 100 in total. Examples of effective and ineffective behavior were selected according to the lowest standard deviation and listed in random order (see Exhibit 3).

As to the rating procedure, it was decided to adapt Smith, Kendall, and Hulin's [1969] approach to rate the responses to their measure of job satisfaction, the Job Description Index. Raters may respond "Yes" (Y), "No" (N), or "Undecided" (?). If a rater responds positively to an effective behavior sample, or negatively to an ineffective sample, the score will be 3 points. A positive response to a negative statement and vice versa results in 0 points. If the respondent is not sure or cannot decide, the response is a question mark, and the score will be 1 point.

In the latter case it is assumed that when a rater is uncertain whether a ratee exhibited a certain behavior or not it indicates a somewhat lower probability that the ratee will exhibit the desirable behavior (or not exhibit undesirable behavior). This is in line with the empirical findings by Smith, et al. [1969], who concluded that an "uncertain" response was more indicative of a negative response than a positive one (p. 79).

Ratee and Rater Sample

This paper reports the results of the first test of the new instrument out of a series of several ongoing tests. A group of 25 assistant branch managers of one of the five Canadian banks were rated by their superiors, using the GRS, BARS, and the BDI as appraisal instruments. The sample was drawn from branches in three Maritime provinces, Nova Scotia, Prince Edward Island, and Newfoundland.

Analyses

Leniency will be measured by assessing the skewness of the different scales [Barrett, Taylor, Parker, and Martens, 1958; Haridas, Frost, and Barnowe, 1977], using a formula suggested by Blalock [1972]. The larger the skewness coefficient the larger is the leniency effect.

Halo effect will be assessed by averaging the correlations between ratings on all job dimensions [Barrett, et al., 1958].

Central Tendency will be measured by analysing the distribution of the scores for every instrument.

Information Content will be assessed by calculating the percentage of actually used job behavior samples from the total available item pool which survived the last validation process.

Results

The means and standard deviations of the ratings are shown in Table 1. Since the BDI utilises a 60-point scale and the GRS and BARS a 7-point sacle, the standardised skewness coefficient for each performance dimension scores of the three instruments are shown in Table 2. An examination of the three skewness coefficients for each dimension reveals that the value for the BDI and the BARS instrument are similar, and closer to zero than the result for the GRS instrument.

The correlations between the different performance dimensions are reported in Table 3. The GRS scores show a significantly higher halo effect than both BARS and BDI scores ($p < .05$, for the GRS-BARS and GRS-BDI differences, according to the sign test; the difference between BARS and BDI is not significant). The GRS format yields 9 significant correlations out of 10, versus 3 for both the BARS and BDI format. By comparing the mean correlation for each instrument, the BDI comes out best with .24, as compared to .32 for the BARS and .49 for the GRS.

In order to measure central tendency effect of the three instruments the score distribution for the five dimensions of each instrument is shown in Table 4. It is interesting to see that the GRS scores contain no ratings in the two lowest scale ranges ("unacceptable" and "moderate"), and in the highest scale range ("excellent"). For the BARS and the BDI instruments only the lowest scale ranges is not utilised.

The degree of utilisation of available information is measured by calculating the percentage of actually used behavior samples from the total available item pool which survived the last validation process.

The results are shown in Table 5. The information content for the GRS could not be determined since it does not use job behavior samples. The data show that the BDI utilised almost three times as many job behavior samples as the BARS, or 83 percent as compared to 30 percent for the latter.

Conclusions

From the results of the study several--cautious--conclusions can be drawn. First, behaviorally oriented scales need not be organization specific. This is an important finding, similar to the one by Goodale and Burke [1975] who demonstrated that BARS need not be job specific. The extension of the use of behavior oriented scales to other, but similar, jobs in the same organization and now even to similar jobs in different organizations in the same industry should make the significantly higher investment in time and effort for the development of behavior oriented scales more worthwhile. It is now possible for organizations to pool their resources to develop such instruments, or delegate such a job to an institution to which all related organizations belong as members; e.g. the Institute of Canadian Bankers, the Trust Companies Association of Canada, the Canadian Manufacturers Association, and others.

As a second result of the study, it has been shown that it is possible to improve the psychometric characteristics of behavior oriented scales in several ways. One of the major shortcomings of the BARS format was the severely limited utilisation of the total pool of information available on the job behavior domain. The switch from a Likert-type scale--which limited the number of behavior samples used per scale to

the number of anchor points--to an anchorless format which allows theoretically the use of the total job behavior domain, seems to be a breakthrough in the search for a performance appraisal instrument with a large and specific amount of feedback information and a superior rating characteristic than BARS.

And thirdly, because of the favorable rating characteristics, the increased utilisation of job information, and the very specific feedback to raters, evaluators, and ratees, it is possible that the BDI can be used as the basis or at least a significant part of a new Personnel Management System, utilising similar types of information in different areas. BDI-type of information can be used for:

1. Job Descriptions, to define scope of activities and major responsibilities connected with a job;
2. Job Analyses, to determine the behavioral aspects of a job;
3. Job Specification, to describe required skills to perform a specific job adequately;
4. Selection Aid, to check whether a "skilled" applicant actually possesses the skills for a specific job;
5. Determining Training Needs; no other instrument appears to be more suitable to assess an employee's strengths and weaknesses than the BDI, because no other device offers such specific feedback on areas where training is needed;
6. Assessment of Trainer's Effectiveness, to measure the specific strengths and weaknesses of instructors by focusing on their effective and ineffective teaching behavior;

7. Measuring Training and Development Program Effectiveness, to assess in detail the outcomes of all types of programs with the aim of changing a participant's behavior;
8. Performance Appraisals, to determine an employee's strengths and weaknesses (shortcomings) in the job behavior domain. The appraisal can be used for different purposes, such as:
   a) counseling, e.g. where to improve
   b) promotion, e.g. as evidence that required skills are demonstrated,
   c) wage and salary administration, e.g. rewards could be offered to those whose job behavior fulfills certain basic standards, and
9. Assessment of Agreement on Organizational Policy, to measure the accuracy of communication of organizational policies; e.g. desirability of specific behaviors, specially at different organizational levels.

It appears that the new behavior oriented evaluation scale, the Behavior Description Index, may be a needed addition to, or perhaps a replacement for, some of the instruments or processes used so far in the area of Personnel Management. Only future research can tell, how strong its position will be.

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Exhibit 1

Job Dimensions of Department Manager

1. Supervising sales personnel
2. Handling customer complaints and making adjustments
3. Meeting day-to-day deadlines
4. Merchandise ordering
5. Developing and planning special promotions
6. Assessing sales trends and acting to maintain merchandising position
7. Using company systems and following through on administrative operations
8. Communicating relevant information to associates and to higher management
9. Diagnosing and alleviating special department problems.

from Campbell, J.P., Dunnette, M.D., Arvey, R.D., and Hellervik, L.V., "The Development and Evaluation of Behaviorally Based Rating Scales." Journal of Applied Psychology, Vol. 57, No. 1 (1973) 15-22.

Exhibit 2

Behaviourally Based Rating Scales

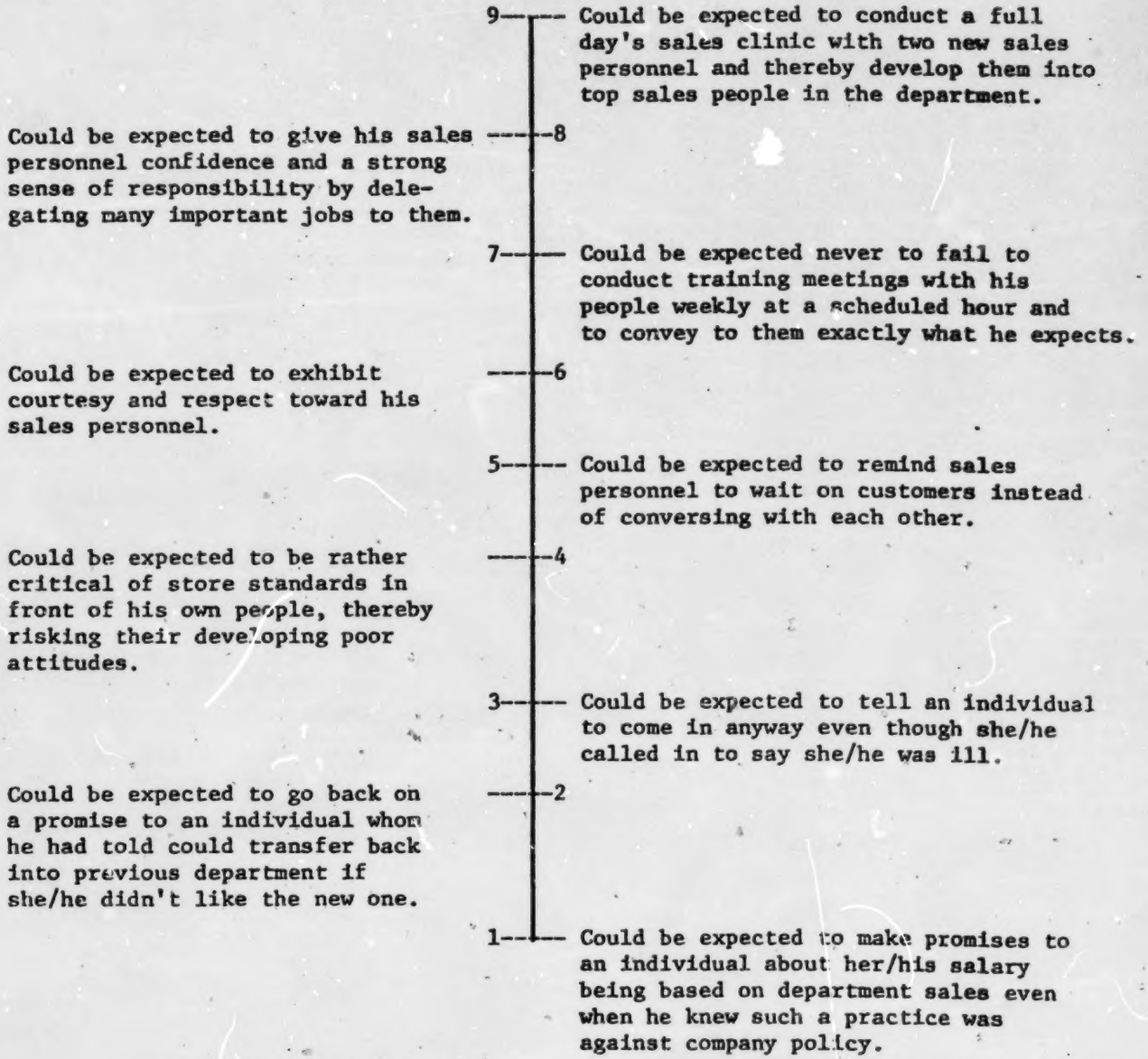

Fig. 1 Scaled expectations rating scale for the effectiveness with which the department manager supervises his sales personnel.

from Campbell, J.P., Dunnette, M.D., Arvey, R.D., and Hellervik, L.V., "The Development and Evaluation of Behaviorally Based Rating Scales." Journal of Applied Psychology, Vol. 57, No. 1 (1973) 15-22.

Exhibit 3

Job Part: Marketing

Description of Responsibilities: advertising, display material, local campaigns, open house, marketing of bank services

Rating Procedure: Please, THINK CAREFULLY before you answer the question: Does this job incumbent exhibit the in following described behavior all the time? (Does it describe his typical behavior?) Use "Y" for Yes, "N" for No, and "?" if you are not certain.

Plans each campaign ahead and sets the goals for his branch.	
Ensures public is aware of new and beneficial timely services through in-branch advertising.	
Is conscious of all opportunities for new business and makes management aware of any new customer with potential for more business.	
Is unable to answer customer inquiries about bank services because of lack of product knowledge, causing dissatisfaction and a bad bank image.	
Does not use materials provided to advertize the Bank's service.	
Sets up a special sales area, easily accessible to the customer, to inform about a new bank service and to market the service.	
Utilizes marketing posters to the best advantage in the branch and regularly moves or replaces them.	
Does not take advantage of contact with non-customers to solicit new accounts.	
Has new advertising material for each item, makes staff aware of it.	
Does nothing ot market bank services. "If the customer wants it he will ask for it".	
When a new campaign is announced this accountant will call a staff meeting, asking for suggestions how the branch can participate effectively.	
Makes staff aware of full range of bank services.	
Ensures that counter officers are cross-selling the bank's services.	
Follows through on outlined promotion campaign.	
Tries to improve on areas where the branch is weak, e.g., if there are a number of unrented safety deposit boxes, he will set up a campaign to sell them.	
Has a sound knowledge of products and services, enabling him to explain all advantages and benefits to a customer.	
Ensures that dirty or torn advertising posters are replaced promptly.	
Fails to inform staff about new campaigns.	
Is not aggressive in selling new bank services.	
Offers incentives to staff to promote bank services during campaigns.	

Exhibit 4

Global Rating Scale

A team of training managers of 5 Canadian banks agreed that the job of a bank accountant (administration officer) can be divided into 5 areas: Administration, Customer Relations, Marketing, Personnel, and Training. You are asked to give an overall rating of the job performance of your accountant (administration officer) in the 5 areas mentioned, using a 7 point scale.

His performance is:

1	2	3	4	5	6	7
unacceptable	mediocre	slightly below average	average	slightly above average	superior	outstanding

Job Area	Please circle the appropriate number
Administration	1 2 3 4 5 6 7
Customer Relations	1 2 3 4 5 6 7
Marketing	1 2 3 4 5 6 7
Personnel	1 2 3 4 5 6 7
Training	1 2 3 4 5 6 7

Exhibit 5

Job Part: Administration

Description of Responsibilities: quarterly analyses, monthly reports, routine work, branch security, internal correspondence, correspondence with other banks, cooperation with manager, supplies, housekeeping, repairs

Rating Procedure: Read every example of the job incumbent's behavior and then put a check-mark (✓) by the example that best represents how you could expect the incumbent you are rating to <u>typically</u> perform in this aspect of his job.

This Accountant (Administration Officer):

7. ____ can be expected to be conscious of security, and effectively controls procedures, thereby resulting in all personnel observing rules and regulations.

6. ____ can be expected to keep down administrative costs through efficiency of operation, i.e., staff are profitably employed, over ordering of stationary is kept to a minimum, lights are not left on all night, staff do not work unnecessary overtime.

5. ____ can be expected to have the Current Account and Personal Chequing ledgers balanced daily.

3. ____ can be expected not to observe deadlines for reports therefore causing hasty jobs, often incorrect.

2. ____ can be expected to be unable to organize his own work load, constantly trying to "catch up", thus setting a poor example for others.

1. ____ can be expected to be unable to develop a good diary system, causing confusion and delays with work.

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR EACH PERFORMANCE DIMENSION ON GRS, AOBARS, AND BDI RESPONSES

Performance Dimensions	GRS Mean	GRS S.D.	AOBARS Mean	AOBARS S.D.	BDI Mean	BDI S.D.
A	5.16	.98	5.40	1.08	48.88	5.65
C	4.88	.78	5.50	.73	46.08	6.14
M	4.12	.78	4.94	1.19	33.80	10.55
P	4.84	.89	5.08	1.16	47.64	6.59
T	4.80	.81	5.50	.82	47.52	6.53

N=25

Note: A=Administration
C=Customer Relations
M=Marketing
P=Personnel
T=Training

GRS was scored on a 7 point scale
AOBARS was scored on a 7 point scale
BDI was scored on a 60 point scale

TABLE 2

NORMALIZED SKEWNESS COEFFICIENT FOR EACH PERFORMANCE DIMENSION ON GRS, AOBARS, AND BDI RESPONSES

	GRS	AOBARS	BDI
A	-2.75	-.55	- .26
C	- .76	1.50	-1.10
M	-1.90	-.78	-1.90
P	-1.01	-.91	.20
T	-2.22	.36	1.04
Mean	-1.72	-.82	-.90

N=25

Note: The mean skewness coefficients were calculated by using the absolute scores.

The skewness coefficients were calculated according to the formula

$$S_k = \frac{3\ (\ \bar{X} - Md\ )}{\sigma}$$ (Blalock, 1972)

$\bar{X}$ = Mean

Md = Median

σ = Standard deviation

TABLE 3

CORRELATIONS BETWEEN DIMENSION SCORES OF EACH OF THE THREE INSTRUMENTS

	GRS	AOBARS	BDI
A/C	51**	36	32
A/M	40*	18	-09
A/P	73**	62**	46*
A/T	61**	44*	51**
C/M	43*	07	00
C/P	38	38	32
C/T	41*	32	35
M/P	26	22	13
M/T	68**	06	-04
P/T	46*	56**	48*
Mean	49	32	24

N=25

A=Administration
C=Customer Relations
M=Marketing
P=Personnel
T=Training

*p< .05
**p< .01

TABLE 4

SCORE DISTRIBUTION FOR FIVE DIMENSIONS
OF EACH GRS, AOBARS, AND BDI INSTRUMENT

Scores	GRS	AOBARS	Scores	BDI
1	0	0	0-10	0
2	0	9	11-20	3
3	10	17	21-30	21
4	40	0	31-40	38
5	45	45	41-50	34
6	30	35	51-60	29
7	0	19		

N=25

TABLE 5

INFORMATION CONTENT FOR AOBARS AND BDI AS
MEASURED BY PERCENTAGE OF ACTUALLY UTILIZED
CRITICAL INCIDENTS FROM TOTAL AVAILABLE INCIDENT POOL

Total Available Pool	Utilized by AOBARS		Utilized by BDI	
#	#	%	#	%
120	30	25	100	83.3